

ABSTRACT OF THE DISCLOSURE

Refractive index change inducing light UV  
outputted from a light source passes a shutter and an  
optical system, and then is reflected by a mirror, so  
5 as to irradiate an optical fiber by way of a phase  
grating mask. A diffracting action of the phase  
grating mask generates a (+)first-order light component  
and a (-)first-order light component, which interfere  
with each other, thereby generating interference  
10 fringes with a fringe interval  $\Lambda$ . As the mirror moves  
along the z axis, an irradiation position at which the  
optical fiber is irradiated with the refractive index  
change inducing light UV by way of the phase grating  
mask is scanned. While moving the mirror upon  
15 irradiation with the refractive index change inducing  
light UV, the phase grating mask is vibrated along the  
z axis under the action of a piezoelectric device. The  
phase or period of vibration varies from scan to scan.